SDG	Samples Affected	Analyte/Analytes	Associated Blank Contamination
PK68203	FX0005, FX0006, FX0008, FX0019, FX0020	Methylene Chloride	Method
PK68204	FX0013, FX0015, FX0016, FX0018	Trichlorofluoromethane, Methylene chloride	Method
PK68205	FX0014	Methylene chloroide	Method
PK68206	FX3003	Methylene chloride	Method/ER
PK68206	FX3003, FX3006, FX3008	Chloroform	MB/ER/TB
PK68206	FX3002, FX3005, FX010	Chloromethane	Trip Blank
PK68208	FX1001, FX1002, FX1005, FX1006, FX1008	Acetone	Method
PK68208	FX1001, FX1002, FX1004, FX1005, FX1006, FX1008	Methylene chloride	Method/ER
PK68209	FX0026	Methylene chloride	Method

'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers, assigned due to quantitation.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied with the exception of the following: positive results were estimated (qualified 'J'); unless 'B' qualified due to blank contamination.

SDG	Samples Affected	Surrogate	Validation Qualifier
PK68201	FX0022	Toluene-d8	J

Matrix Spike/Matrix Spike Duplicate

MS/MSD and laboratory control sample (LCS) were performed for the project samples and all

QC criteria were met.

Field Duplicates

Original and field duplicate (FD) results were evaluated and no problems were noted.

Internal Standards

All internal standards met criteria with the exception of the following:

- All compounds associated with the internal standards listed in the table below were qualified as indicated.

SDG	Samples Affected	Internal Standard Outside QC Limits	Validation Qualifier
PK68201	FX0003, FX0022	1,4-Dichlorobenzene	J/UJ
PK68201	FX0022	Chlorobenzene-d5	J/UJ
PK68203	FX0006, FX0008, FX0019	1,4-Dichlorobenzene	J/UJ
PK68204	FX0013	1,4-Dichlorobenzene	J/UJ
PK68208	FX1001, FX1002, FX1004, FX1005, FX1006, FX1008	1,4-Dichlorobenzene	J/UJ

Quanitation

Results quantitated between the MDL and the RL, which the lab qualified as "J," were qualified as estimated 'J' unless blank contamination was present or the results were rejected.

4.2 Target Compound List Semivolatiles by GC/MS SW-846-8270C

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exceptions of the following:

The following exhibited individual ICAL %RSD>30 and/or CCAL %D>20:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK68201	FX0001, FX0002, FX0003, FX0004, FX0009, FX0010, FX0011, FX0021, FX0022, FX0023, FX0024, FX0025	Hexachlorocyclopentadiene, 2,4-Dinitrophenol, 4-Nitrophenol	UJ
PK68201	FX0001, FX0002, FX0003, FX0009, FX0011, FX0021, FX0022, FX0023, FX0024, FX0025	Benzo (ghi) perylene, 4,6-Dinitro-2-methylphenol	UJ
PK68201	FX0004, FX0010	2,2'-oxybis (1-Chloropropane)	UJ
PK68202	FX0012	3-Nitroaniline, 4-Nitrophenol, 2-2'-oxybis (1-Chloropropane	UJ
PK68203	FX0005, FX0006, FX0008, FX0019, FX0020	2,4-Dinitrophenol, 4-Nitrophenol, Dibenz-(a,h)-anthracene, 2,2'-oxybis (1-Chloropropane)	UJ
PK68204	FX0013, FX0016, FX0018	2,4-Dinitrophenol, Hexachlorocyclopentadiene, 2,2'oxybis (1-Chloropropane)	UJ
PK68204	FX0015	Hexachlorocyclopentadiene, 2-Nitroaniline, 2,4-Dinitrophenol, 4-Nitrophenol, 4,6-Dinitro-2-methylphenol	UJ
PK68205	FX0014	Hexachlorocyclopentadiene	UJ
PK68206	FX3001, FX3002, FX3003, FX3005, FX3006, FX3007, FX3008, FX3009, FX3010	Hexachlorocyclopentadiene	UJ

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK68206	FX3007, FX3008	4-Nitrophenol, 2-Nitroaniline, Butyl benzyl phthalate, bis (2-Ethylexyl) phthalate	J/UJ
PK68206	FX3001, FX3002, FX3003, FX3005, FX3009, FX3010	3,3'-Dichlorobenzidine	UJ
PK68206	FX3006	2,2'-oxybis (1-Chloropropane), Nitrobenzene, N-Nitroso-di-n-Propylamine, 2-Nitroaniline, 4-Nitrophenol, Nitrobenzene	UJ
PK68208	FX1001, FX1002, FX1004, FX1005, FX1006, FX1008	4-Chloroaniline, 3-3'-Dichlorobenzidine, 2-Nitroaniline, 3-Nitroaniline, 4-Nitrophenol	UJ
PK68209	FX0026	3,3'-Dichlorobenzidine, Carbazole	UJ

Blanks

The 5X/10X rule for contaminants found in the associated equipment rinsates and method blanks was applied to all sample results. All were found to be acceptable with the exception of the following:

Note: 'B' qualifiers were applied to all of the following sample results.

SDG	Samples Affected	Analyte/Analytes	Associated Blank Contamination
PK68201	FX0021, FX0022, FX0023, FX0024, FX0025	bis (2-Ethylhexyl) phthalate	Method
PK68203	FX0006, FX0008, FX0019, FX0020	bis (2-Ethylhexyl) phthalate	Method
PK68204	FX0013, FX0015, FX0016, FX0018	bis (2-Ethylhexyl) phthalate	Method

SDG	Samples Affected	Analyte/Analytes	Associated Blank Contamination
PK68206	FX3001, FX3002, FX3003, FX3005, FX3006, FX3007, FX3010	Phenol	Method / ER
PK68208	FX1004, FX1005, FX1006	Di-n-butyl phthalate	Method

'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers, assigned due to quantitation.

Surrogate Recoveries

All surrogate recoveries met QC criteria.

Matrix Spike/Matrix Spike Duplicate

Batch QC, MS/MSD, and LCS were performed for the project samples and all QC criteria were met.

Field Duplicates

Original and field duplicate results were evaluated and exceeded the 50 percent relative percent difference (RPD) criteria applied:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK68203	FX0005, FX0006	Benzo (ghi) perylene, Benzo (a) pyrene	J

Note: High RPDs are most likely due to matrix interferences and sample nonhomogeneity.

Quanitation

Results quantitated between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected.

4.3 Metals by SW-846-6010B/7471A/7470A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibrations

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse, calibration, and method blanks was applied to all sample results. All were acceptable with the exceptions noted below:

Note: 'B' qualifiers were applied to all of the following sample results.

SDG	Samples Affected	Analyte	Associated Blank Contamination
PK68201	FX0011	Vanadium	ICB/CCB
PK68203	FX0005, FX0006, FX0008, FX0019, FX0020	Sodium	Method/ER
PK68203	FX0020	Calcium	Method/ER
PK68204	FX0013, FX0015, FX0016, FX0018	Sodium	Method/ER
PK68204	FX0015, FX0016, FX0018	Calcium	ER
PK68205	FX0014	Beryllium	ICB/CCB
PK68205	FX0014	Calcium	Method
PK68206	FX3001, FX3002, FX3003, FX3006, FX3007, FX3008, FX3009, FX3010	Thallium	Method/ER
PK68206	FX3001, FX3002, FX3003, FX3010	Chromium	ICB/CCB
PK68206	FX3001, FX3002, FX3003, FX3005, FX3006, FX3007, FX3008, FX3009, FX3010	Potassium	Method/ICB/CCB /ER

SDG	Samples Affected	Analyte	Associated Blank Contamination
PK68206	FX3001, FX3002, FX3003, FX3010	Vanadium	ER
PK68207	FX2001, FX2002, FX2003, FX2004, FX2006	Sodium	Method/ICB/CCB
PK68207	FX2001, FX2002, FX2004	Thallium	ICB/CCB
PK68207	FX2001, FX2002	Beryllium	ICB/CCB
PK68208	FX1001,FX1002, FX1004, FX1005, FX1006, FX1008	Sodium	Method/ER
PK68208	FX1002	Thallium	ER
PK68209	FX0026	Sodium	MB/ICB/CCB/ER

Matrix Spike/Matrix Spike Duplicate

Batch QC was performed for the project samples and all QC criteria were met with the following exceptions:

SDG	Samples Affected	Element/Elements	Validation Qualifier
PK68201	FX0001, FX0002, FX0003, FX0004, FX0009, FX0010, FX0011, FX0021, FX0022, FX0023, FX0024, FX0025	Copper, Zinc, Antimony	J/UJ
PK68202	FX0012	Lead, Antimony, Barium, Cobalt	J/UJ
PK68203	FX0005, FX0006, FX0008, FX0019, FX0020	Lead, Antimony, Barium, Calcium	J/UJ
PK68205	FX0014	Antimony, Chromium, Magnesium	J/UJ

Laboratory Control Sample

All QC criteria were met for the LCS associated with the project sample analyses.

Interference Check Sample

All interference check sample (ICS) percent recoveries, where applicable, were acceptable.

Inductively Coupled Plasma Serial Dilutions

All QC criteria, where applicable, were met with the following exceptions:

SDG	Samples Affected	Analyte	Validation Qualifier
PK68201	FX0001, FX0002, FX0003, FX0004, FX0009, FX0010, FX0011, FX0021, FX0022, FX0023, FX0024, FX0025	Zinc	J
PK68206	FX3001, FX3002, FX3003, FX3005, FX3006, FX3007, FX3008, FX3009, FX3010	Calcium, Manganese, Sodium	J

Field Duplicates

Original and FD results were evaluated and the following exceeded the 50 percent RPD criteria applied:

SDG	Samples Affected	Element/Elements	Validation Qualifier
PK68203	FX0005, FX0006	Aluminum, Beryllium, Calcium, Magnesium	J
PK68206	FX3003, FX3005	Aluminum, Cobalt	J

Note: High RPDs are most likely due to matrix interferences and sample nonhomogeneity

Sample Quantitation

Results quantitated between the instrument detection limit (IDL) and the RL ('B' flagged by the laboratory) were qualified as estimated ('J').

4.4 Chlorinated Pesticides by SW-846-8081A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exceptions of the following:

- The following exhibited individual primary CCAL %D>15 and/or confirmation %D>25 percent: nondetect results were estimated (qualified 'UJ'); positive results were estimated (qualified 'J'); unless 'B' qualified due to blank contamination; unless 'R' qualified due to quadratic correlation coefficient less than 0.990.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK68203	FX0005, FX0006, FX0008, FX0019, FX0020	4,4'-DDD, Endrin, Methoxychlor	UJ
PK68205	FX0014	4,4-DDT, Endrin, Heptachlor, Methoxychlor	UJ
PK68209	FX0026	alpha-BHC, gamma-BHC, Endosulfan II	R

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike/Matrix Spike Duplicate

MS/MSD and LCS were performed for the project samples and all QC criteria were met with the following exceptions:

SDG	Samples Affected	Analyte	Validation Qualifier
PK68201	FX0001, FX0002, FX0003, FX0004, FX0009, FX0010, FX0011, FX0021, FX0022, FX0023, FX0024, FX0025	Aldrin, gamma-BHC, 4,4'-DDT, Dieldrin, Endrin, Heptachlor	UJ

Field Duplicates

Original and FD results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.5 Organophosphorous Pesticides by SW-846-8041A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exceptions of the following:

- The following exhibited individual primary CCAL %D>15 and/or confirmation %D>25 percent: nondetect results were estimated (qualified 'UJ'); positive results were estimated (qualified 'J'); unless 'B' qualified due to blank contamination

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK68201	FX0009, FX0010, FX0011	Naled	UJ

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK68201	FX0001, FX0002	Dimethoate, Parathion, Famphur	UJ
PK68202	FX0012	Dimethoate, Disulfoton, Thionazin, Famphur, Parathion, Phorate, Sulfotepp, Parathion methyl	UJ
PK68204	FX0013, FX0015, FX0016, FX0018	Bolstar, Chlorpyrifos, Disulfoton, Fensulfothion, Fenthion, Malathion, Merphos, Stirophos, Tokuthion, Trichloronate, Parathion methyl	UJ
PK68206	FX3002, FX3003, FX3005, FX3006, FX3010	Dimethoate, Disulfoton, Thionazin, Famphur, Parathion, Phorate, Sulfotepp, Parathion methyl	UJ
PK68206	FX3007, FX3008, FX3009	Merphos	UJ
PK68206	FX3001	all analytes	UJ

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike/Matrix Spike Duplicate

MS/MSD and LCS were performed for the project samples and all QC criteria were met.

Field Duplicates

Original and FD results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as "J," were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.6 Herbicides by SW-846-8151A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples with the exception of the reanalysis of SDG PK68203 (samples: FX0005, FX0006, FX0008, FX0019, FX0020) and SDG PK68204 (samples: FX0013, FX0015, FX0016 FX0018). Reextraction and reanalysis was performed outside of hold times, which resulted in the estimation of all sample results for SDG PK68204. All data for PK68203 was rejected due to hold times grossly exceeded.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied. It should be noted that samples in the original analysis of SDGs PK68203 and PK68204, exhibited surrogate recoveries that were less than 10 percent. Upon reextraction and reanalysis, acceptable recoveries were obtained; however, results were estimated or rejected (based upon the severity) due to missed hold times.

Matrix Spike/Matrix Spike Duplicate

MS/MSD and LCS were performed for the project samples and all QC criteria were met with the following exceptions:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK68205	FX0014	2,4,5-T	UJ

Field Duplicates

Original and FD results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.8 Wet Chemistry - Total Organic Carbon by SW-846-9060

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Matrix Spike / Matrix Spike Duplicate

MS/MSD and LCS were performed for the project samples and all QC criteria were met.

Field Duplicates

Original and FD results were evaluated and no problems were noted.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

5.0 Quality Assurance Field Split Sample Data Evaluation

Data from the quality assurance split samples supplied to IT by the U.S. Army Corps of Engineers were reviewed for comparability to the original and FD results. RPDs were calculated and the results are summarized in this section.

- FS data for SDG PK68203

Note: Field Split Laboratory - Specialized Assays, Inc., Nashville, Tennessee.

Original Sample ID FX0005	Field Dup ID FX0006	Field Split ID FX0007	Units	Compounds / Elements	Original / Field Split RPD	% RSD
.016	**.022**	nd	mg/k	Mercury		
3470	6060	2590	mg/k	Aluminum	29.0%	44.7%
3.9	4.4	1.33	mg/k	Arsenic	98.3%	51.3%
12.4	13.5	10.3	mg/k	Lead	18.5%	13.5%
99.6	117	66.5	mg/k	Barium	39.9%	27.2%
.56	1	nd	mg/k	Beryllium		
.74	**.87**	nd	mg/k	Thallium		
5140	12700	1600	mg/k	Calcium	105.0%	87.5%
12.1	12.9	6.67	mg/k	Chromium	57.9%	32.1%
3.9	**4.1**	nd	mg/k	Cobalt		
10.7	12.1	3.24	mg/k	Copper	107.0%	54.9%
20000	22100	9180	mg/k	Iron	74.2%	40.6%
1210	3150	610	mg/k	Magnesium	65.9%	80.1%
591	744	328	mg/k	Manganese	57.2%	38.0%
6.6	7.9	3.24	mg/k	Nickel	68.3%	40.7%
623	910	349	mg/k	Potassium	56.4%	44.7%
1.1	nd	nd	mg/k	Silver		
92.3	**147**	184	mg/k	Sodium	-66.4%	32.7%
6.6	9.3	12.2	mg/k	Vanadium	-59.6%	29.9%

Original Sample ID FX0005	Field Dup ID FX0006	Field Split ID FX0007	Units	Compounds / Elements	Original / Field Split RPD	% RSD
24.3	30.5	15	mg/k	Zinc	47.3%	33.5%
7	nd	nd	ug/kg	Acetone		
3	2.7	nd	ug/kg	Methylene chloride		
63	170	nd	ug/kg	Benzo(ghi)perylene		
40	140	nd	ug/kg	Benzo(a)pyrene		
nd	33	nd	ug/kg	Benz(a)anthracene		
nd	98	nd	ug/kg	Benzo(b)fluoranthene		
nd	72	nd	ug/kg	Benzo(k)fluoranthene		
nd	74	nd	ug/kg	bis(2-Ethylhexyl) phthalate		
nd	49	nd	ug/kg	Chrysene		
nd	50	nd	ug/kg	Fluoranthene		
nd	91	nd	ug/kg	Indeno(1,2,3-cd)pyrene		
nd	50	nd	ug/kg	Pyrene		
.81	nd	nd	ug/kg	delta-BHC		
2.2	nd	nd	ug/kg	4,4' - DDT		
2.3	nd	nd	ug/kg	Heptachlor		

Metals: Majority of the same metals detected in all samples. Majority of RPD values above the QC limit, differences attributed to lack of sample homogeneity.

Volatiles: No detects in the FS sample. Acetone and methylene chloride detected in the original and FD sample, both below the RL and a common laboratory contaminants.

Semivolatiles: No detects in the FS sample. All semivolatiles detected in the original and FD sample were below the RL. Differences attributed to lack of sample homogeneity and/or FS lab not reporting results below the RLs.

Chlorinated and Organophosphorous Pesticides, Herbicides: No compounds detected in samples.

- FS data for SDG PK68204

Original Sample ID FX0015	Field Dup ID FX0016	Field Split ID FX0017	Units	Compounds / Elements	Original / Field Split RPD	% RSD
nd	.012	nd	mg/k	Mercury		
5480	5620	6080	mg/k	Aluminum	-10.4%	5.5%
4	4.2	3.07	mg/k	Arsenic	26.3%	16.1%

Original Sample ID FX0015	Field Dup ID FX0016	Field Split ID FX0017	Units	Compounds / Elements	Original / Field Split RPD	% RSD
4	5.5	1.92	mg/k	Lead	70.3%	47.2%
18.3	**18.8**	31.5	mg/k	Barium	-53.0%	32.7%
.66	.88	nd	mg/k	Beryllium		
nd	nd	6.91	mg/k	Cadmium		
56.9	**53.3**	45.1	mg/k	Calcium	23.1%	11.7%
21	24.5	13.8	mg/k	Chromium	41.4%	27.6%
4.1	**5.1**	nd	mg/k	Cobalt		
17.9	21.7	13.8	mg/k	Copper	25.9%	22.2%
27500	34900	18700	mg/k	Iron	38.1%	30.0%
136	**142**	175	mg/k	Magnesium	-25.1%	13.9%
44.1	57.3	33.2	mg/k	Manganese	28.2%	26.9%
5.6	6.4	4.61	mg/k	Nickel	19.4%	16.2%
1240	1280	1050	mg/k	Potassium	16.6%	10.3%
.92	**.75**	25	mg/k	Silver	-185.8	156.9
41.2	**38.5**	101	mg/k	Sodium	-84.1%	58.7%
17.1	21	24.8	mg/k	Vanadium	-36.8%	18.4%
13.9	18.5	15.7	mg/k	Zinc	-12.2%	14.5%
14	**13**	nd	ug/kg	Acetone		
3.2	**3.9**	nd	ug/kg	Trichlorofluoromethane		
11	9.4	nd	ug/kg	Methylene Chloride		
59	**73**	nd	ug/kg	bis(2-Ethylhexyl)		

Metals: Majority of the same metals were found in, and within QC limits in all three samples. Three results were outside the QC limits, two (barium, sodium) of which were between the RL and the MDL. Differences are attributed to lack of sample homogeneity.

Volatiles: No volatiles detected for FS. Trichlorofluoromethane was detected below the reporting in the original and FD. Acetone and methylene chloride were detected in the original and FD, both are common laboratory contaminants and detected below the RL.

Semivolatiles: bis(2-Ethylhexyl) was detected below the RL in the original and FD sample and is a common laboratory contaminant.

Chlorinated and Organophosphorus Pesticides, Herbicides: No detections in all three samples.

- FS data for SDG PK68206

Original Sample ID FX3003	Field Dup ID FX3005	Field Split ID FX3004	Units	Compounds / Elements	Original / Field Split RPD	% RSD
136	**94.9**	249	ug/L	Aluminum	-58.7%	49.9%
102	**98.2**	79	ug/L	Barium	25.4%	13.2%
4.7	nd	nd	ug/L	Thallium		
5230	5040	3930	ug/L	Calcium	28.4%	14.8%
4.8	nd	nd	ug/L	Chromium		
12.7	**8.4**	nd	ug/L	Cobalt		
350	321	241	ug/L	Iron	36.9%	18.6%
2300	**2210**	1830	ug/L	Magnesium	22.8%	11.8%
1830	1770	1310	ug/L	Manganese	33.1%	17.4%
12.2	**15.7**	nd	ug/L	Nickel		
2380	**1800**	nd	ug/L	Potassium		
1140	**1070**	1120	ug/L	Sodium	1.8%	3.2%
8	nd	nd	ug/L	Vanadium		
nd	**1.7**	nd	ug/L	Acetone		
nd	**.33**	nd	ug/L	Chloromethane		
.36	nd	nd	ug/L	Chloroform		
5	nd	nd	ug/L	Methylene Chloride		
1	**1.2**	nd	ug/L	Phenol		

Metals: Majority of the same metals detected in all samples. Two (aluminum, iron) metal results had high RPD values, aluminum was detected below the RL in the original and FD samples.

Volatiles: No volatiles detected in FS sample. Three compounds detected in the original and FD samples all were below the RL. Acetone and methylene chloride are common laboratory contaminants.

Semivolatiles: No semivolatiles detected in FS sample. Phenol was detected in the original and FD sample below the RL. Phenol is a common laboratory contaminant.

Chlorinated and Organophosphorus Pesticides, Herbicides: No detections in all three samples.

- FS data for SDG PK68208

Original Sample ID FX1001	Field Dup ID FX1002	Field Split ID FX1003	Units	Compounds / Elements	Original / Field Split RPD	% RSD

Original Sample ID FX1001	Field Dup ID FX1002	Field Split ID FX1003	Units	Compounds / Elements	Original / Field Split RPD	% RSD
.027	**.028**	nd	mg/k	Mercury		
12400	11300	7630	mg/k	Aluminum	47.6%	23.9%
4.2	3.6	2.24	mg/k	Arsenic	60.9%	30.0%
12	10.7	5.51	mg/k	Lead	74.1%	36.5%
108	94	104	mg/k	Barium	3.8%	7.1%
1.4	1.1	nd	mg/k	Selenium		
1.0	.93	nd	mg/k	Beryllium		
nd	**.75**	nd	mg/k	Thallium		
662	**653**	471	mg/k	Calcium	33.7%	18.1%
21.6	19.4	12.7	mg/k	Chromium	51.9%	25.9%
5.7	**5.3**	nd	mg/k	Cobalt		
40.6	35.7	22	mg/k	Copper	59.4%	29.4%
30200	27600	16000	mg/k	Iron	61.5%	30.7%
1710	1590	1200	mg/k	Magnesium	35.1%	17.8%
197	167	109	mg/k	Manganese	57.5%	28.4%
13.2	12	7.76	mg/k	Nickel	51.9%	26.0%
2290	2110	1640	mg/k	Potassium	33.1%	16.7%
67.9	**58.6**	237	mg/k	Sodium	-110.9	82.9%
33.4	30.2	16.3	mg/k	Vanadium	68.8%	34.1%
35.4	31.6	22.4	mg/k	Zinc	45.0%	22.4%
14	**13**	nd	ug/kg	Acetone		
6.9	**5.2**	nd	ug/kg	Trichlorofluoromethane		
7.4	**7.7**	nd	ug/kg	Methylene chloride		

Metals: Majority of the same elements detected in all samples. High RPD values attributed to lack of homogeneity in soils.

Volatiles: No volatiles reported in the FS. Volatiles detected in the original and FD were below the RL. Acetone and methylene chloride are common lab contaminants.

Semivolatiles/Pesticides/Herbicides: No detections in samples.

ATTACHMENT A

Validation Qualifiers

U Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit.

J The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

B The concentration reported was detected significantly above the levels reported in the associated equipment rinse samples and/or laboratory method and trip blanks. (5X/10X Rule was applied).

R The reported sample results are rejected due to the following:

1. Severe deficiencies in the supporting quality control data.
2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data.
3. The presence or absence of the constituent cannot be verified based on the data provided.
4. To indicate not to use a particular result in the event of a reanalysis.

UJ The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the 'non-detect' maybe inaccurate or imprecise. The non-detect result should be estimated.

Validation Reason Code Definitions

Reason Code	Description
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding Time Exceeded
02A	Extraction
02B	Analysis
03	Instrument Performance - Outside Criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient <0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits

Validation Reason Code Definitions

Reason Code	Description
10A	Recovery
10B	Retention Time
11	Laboratory control sample recoveries outside specified control limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgement was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings

Data Validation Summary Report for the Site Investigation Performed at the "Post Garbage Dump North of Reilly Field" (Parcel FTA-126) Fort McClellan, Calhoun County, Alabama

1.0 Introduction

Level III data validation was performed on 100 percent of the environmental samples collected at Parcel FTA-126. The analytical data consisted of seven sample delivery groups (SDG), PK512601, PK512602, PK512603, PK512604, PK512605, PK512606, and PK512607 which was analyzed by Quanterra Incorporated. In addition, an evaluation of the field split data, which was analyzed by the USACE-SAD laboratory is included in this report. The chemical parameters for which the samples were analyzed are identified below:

Parameter (Method)
Target Compound List Volatile Organics by Gas Chromatrography/Mass Spectrometry SW-846-8260B
Target Compound List Semivolatiles by GC-SW-846-8270C
Metals by SW-846-6010B and 7471A/7470A
Pesticides by SW-846-8081A
Organophosphorus Pesticides by SW-846-8141A
Herbicides by SW-846-8151A
Polychlorinated Biphenyls by SW-846-8082
Wet Chemistry - Total Organic Carbon by SW-846-9060

2.0 Procedure

The sample data were validated following the logic identified in the 1994 U.S. Environmental Protection Agency (EPA) *Contract Laboratory Program National Functional Guidelines For Inorganic Data Review* and 1999 EPA *Contract Laboratory Program National Functional Guidelines For Organic Review* for all areas except blanks. The EPA 1993 *Region III Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses* and 1992 *Region III National Functional Guidelines for Organic Data Review* were applied to the areas associated with blank contamination. Specific quality control (QC) criteria, as identified in the quality assurance plan (QAP), analytical methods, and laboratory standard operating procedures (SOPs) were applied to all sample results. As the result of the use of Update III SW-846 test methods for the analytical data and the application of the Contract Laboratory Program (CLP)

guidelines during the validation process, there were instances where specific QC requirements for all target compounds were not defined. This primarily occurred in the organic, gas chromatography (GC) and GC/mass spectrometry calibration areas and is due to the fact that the analytical methods are "performance-based," and allows the use of average calibration responses in lieu of individual responses, which are defined by CLP protocol. In light of applying CLP guidelines to SW-846 methods and evaluating the usability of the data during the validation process, specific QC criteria were determined to address all target compounds and are identified in this report for each parameter, as well as in the validation checklists, which function as worksheets. All completed validation checklists are on file in the Knoxville office. For those analytical methods not addressed by the CLP and Region III guidelines, the validation was based on the method requirements (i. e., SW-846, Code of Federal Regulations, SOP) and technical judgment following the logic of the CLP validation guidelines.

3.0 Summary of Data Validation Findings

The overall quality of the data was determined to be acceptable. The only rejected data ('R' qualified) was due to "poor performing" volatile compounds (ketones, some halogenated hydrocarbons, e.g.), which exhibited poor calibration responses in the associated calibration data, chlorinated pesticide compound, toxaphene, results for various samples were rejected due to the lack of toxaphene in the initial calibration, and samples that were reanalyzed and have more than one result reported. The 'R' qualifier was assigned to the samples with more than one set of results to indicate that a given result should not be used to characterize a particular constituent or an analysis for a given sample.

This validation report has been prepared for all the samples associated with this investigation, and the overall results of the validation findings are summarized in this report. A listing of the validation qualifiers and the reason codes, along with their definitions, is also found in Attachment A. These qualifiers and reason codes were applied to the data and stored in the FTMC database. The following section highlights the key findings of the data validation for each analysis.

4.0 Analysis-Specific Data Validation Summaries

4.1 Volatile Organics by GC/MS SW-846-8260B

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exceptions of the following:

- The following demonstrated relative response factors (RRFs) below 0.1 in the ICAL and/or CCAL: nondetect results were rejected (qualified 'R'). Positive results were estimated (qualified 'J') unless 'B' qualified due to blank contamination.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK512601	EF1001, EF1002, EF1003	Acetone, Bromomethane	R/J
PK512602	EF2001, EF2004, EF2005	Acetone, Bromochloromethane, Dibromomethane, 2-Butanone, Bromomethane, 1,2-Dibromo-3-chloropropane	R/B
PK512603	EF0009, EF0010	Acetone, Bromomethane, Bromochloromethane, Dibromomethane, 2-Butanone, 1,2-Dibromo-3-chloropropane	R/B/J
PK512603	EF0009	2-Hexanone	R
PK512604	EF0011R	Acetone, 2-Butanone Bromochloromethane, Dibromomethane, 1,2-Dibromo-3-chloropropane	R/J
PK512605	EF0001, EF0003, EF0007, EF0008	Acetone, 2-Butanone	R/B/J

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK512606	EF3001, EF3002, EF3003, EF3005	Acetone, 2-Butanone, Bromochloromethane, Dibromomethane, 1,2-Dibromo-3-chloropropane	R
PK512607	EF0002, EF0004, EF0005	Acetone, Bromochloromethane, 2-Butanone	R/B

- The following exhibited individual ICAL %RSD>30 and/or CCAL %D>20: nondetect results were estimated (qualified 'UJ') unless rejected (qualified 'R') due to ICAL/CCAL minimum RRF criteria not met. Positive results were estimated (qualified 'J') unless 'B' qualified due to blank contamination.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK512601	EF1001, EF1002, EF1003	Bromomethane, Chloromethane, Chloroethane, Dichlorodifluoromethane, Naphthalene, 1,2-dibromo-3-chloropropane	R/UJ
PK512602	EF2001, EF2004, EF2005	Bromomethane, Chloromethane, Naphthalene	R/UJ
PK512603	EF0009, EF0010	Methylene chloride, Naphthalene	B/UJ
PK512603	EF0009	Chloromethane, Bromomethane, 2-Hexanone, 1,2-Dibromo-3-chloropropane, Hexachlorobutadiene, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene	R/B/UJ
PK512605	EF0001, EF0003, EF0007, EF0008	Acetone, Methylene chloride	R/B/J
PK512606	EF3001, EF3002, EF3003, EF3005	Methylene chloride, Dichlorodifluoromethane, Chloromethane, Naphthalene, 1,2,3-Trichlorobenzene	UJ
PK512607	EF0002, EF0004, EF0005	Methylene chloride	B

Blanks

The 5X/10X rule for contaminants found in the associated equipment rinses, trip blanks, and

method blanks was applied to all sample results. All were found to be acceptable with the exception of the following:

Note: 'B' Qualifiers were applied to all of the following sample results.

SDG	Samples Affected	Analyte/Analytes	Associated Blank Contamination
PK512601	EF1001, EF1002, EF1003	Methylene chloride	Method
PK512602	EF2001, EF2004, EF2005	Acetone	TB
PK512603	EF0009	Bromomethane, 2-Butanone, Trichloroethene	Method, ER
PK512603	EF0009, EF0010	Methylene chloride	Method
PK512604	EF0011R	Methylene chloride	Method
PK512605	EF0001, EF0003, EF0007, EF0008	Methylene chloride	Method
PK512605	EF0007	Acetone	ER
PK512607	EF0002, EF0004, EF0005	Methylene chloride	Method
PK512607	EF0004, EF0005	Acetone	ER

* 'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers assigned due to quantitation.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied, with the exceptions of the following: The surrogate's, which experienced high recoveries, are identified below, which resulted in the estimation of all detected compounds that were reported for the samples.

SDG	Samples	Surrogate	Validation Qualifiers
PK512603	EF0009, EF0010	1,2-Dichloroethane	*B/J
PK512605	EF0003	Bromofluorobenzene	*B/J
PK512607	EF0004, EF0005	Bromofluorobenzene	*B/J

* 'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers assigned due to quantitation.

Matrix Spike/Matrix Spike Duplicate

Matrix spike/matrix spike duplicate (MS/MSD) and Laboratory Control Sample (LCS) was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and field duplicate (FD) results were evaluated and all QC criteria were met.

Internal Standards

All internal standards met criteria with the exception of the following:

- All compounds associated with the internal standards listed in the table below were qualified as indicated.

SDG	Samples Affected	Internal Standard Outside QC Limits	Validation Qualifier
PK512601	EF1001, EF1002, EF1003	1,4-Dichlorobenzene-d4	UJ
PK512603	EF0010	Fluorobenzene, Chlorobenzene -d5, 1,4-Dichlorobenzene-d4	**R/*B/J/UJ
PK512604	EF0011R	1,4-Dichlorobenzene-d4	**R/UJ
PK512605	EF0003	1,4-Dichlorobenzene-d4	UJ
PK512607	EF0004, EF0005	Chlorobenzene-d5 1,4-dichlorobenzene-d4	J/UJ

* 'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers assigned due to quantitation.

** 'R' qualifiers take precedence over estimating qualifiers.

Quantitation

Results quantitated between the maximum detection limit (MDL) and the reporting limit (RL), which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was

present or the results were rejected.

4.2 TCL Semivolatiles by GC/MS SW-846-8270C

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria with the exceptions of the following:

- The following exhibited individual ICAL %RSD>30 and/or CCAL %D>20:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK512601	EF1001, EF1002, EF1003	Benzo(k)fluoranthene, 2,2' -oxybis(1-Chloropropane)	UJ
PK512602	EF2001, EF2004	4,6-Dinitro-2-methylphenol, 2,4-Dinitrophenol	UJ
PK512603	EF0009, EF0010, EF0011	4-Nitroaniline, 4-Nitrophenol, 2,2'-oxybis(1-Chloropropane)	UJ
PK512606	EF3001	3,3'-Dichlorobenzidine, Hexachlorocyclopentadiene	UJ
PK512607	EF0002, EF0004, EF0005	3,3'-Dichlorobenzidine	UJ

Blanks

The 5X/10X rule for contaminants found in the associated equipment rinsates and method blanks was applied to all sample results. All were found to be acceptable with the exception of the following:

Note: 'B' Qualifiers were applied to all of the following sample results.

SDG	Samples Affected	Analyte/Analytes	Associated Blank Contamination
PK512601	EF1001, EF1002, EF1003	bis(2-Ethylhexyl)phthalate	Method
PK512602	EF2001, EF2003, EF2004	Phenol	Method

* 'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers assigned due to quantitation.

Surrogate Recoveries

All surrogate recoveries met QC criteria.

Matrix Spike/Matrix Spike Duplicate

Batch QC, MS/MSD, and LCS were performed for the project samples and all QC criteria were met, with the exceptions of the following;

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK512605	EF0001, EF0003, EF0007, EF0008	1,4-Dichlorobenzene	UJ

Field Duplicates

Original and field duplicate results were evaluated and all QC criteria were met.

Internal Standards

All internal standards met criteria.

Quantitation

Results quantitated between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected.

4.3 Metals by SW-846-6010B/7471A/7470A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing calibrations

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse, calibration, and method blanks was applied to all sample results. All were acceptable with the exceptions noted below:

SDG	Samples Affected	Analyte	Associated Blank Contamination
PK512601	EF1002	Zinc	ER
PK512602	EF2004	Lead	CCB
PK512605	EF0001, EF0003, EF0007, EF0008	Sodium	Method/CCB/ER
PK512605	EF0003	Potassium	CCB
PK512606	EF3001	Thallium	Method/ER
PK512606	EF3001, EF3002, EF3003, EF3005	Sodium	Method/CCB/ER
PK512606	EF3005	Aluminum, Iron	Method/CCB
PK512607	EF0002, EF0004, EF0005	Sodium	Method/CCB/ER

Matrix Spike/Matrix Spike Duplicate

Batch QC was performed for the project samples and all QC criteria were met with the following exceptions:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK512605	EF0001, EF0003, EF0007, EF0008	Antimony, Barium, Chromium, Copper, Silver	J/UJ
PK512607	EF0002, EF0004, EF0005	Antimony, Selenium, Sodium	*B/J/UJ

* 'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers assigned due to quantitation.

Laboratory Control Sample

All QC criteria were met for the LCS associated with the project sample analyses.

Interference Check Sample

All ICS % recoveries, where applicable, were acceptable and all QC criteria were met.

Inductively Coupled Plasma Serial Dilutions

All QC criteria were met for the serial dilutions associated with the project sample analyses, with the exceptions of the following:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK512605	EF0001, EF0003, EF0007, EF0008	Aluminum, Lead, Barium, Calcium, Cobalt, Copper, Iron, Magnesium, Manganese, Vanadium, Zinc	J
PK512607	EF0002, EF0004, EF0005	Aluminum, Lead, Barium, Calcium, Chromium, Iron, Magnesium, Manganese, Vanadium, Zinc	J

Field Duplicates

Original and field duplicate results were evaluated and all QC criteria were met, with the exceptions of the following:

SDG	Samples Affected	Analyte	Validation Qualifier
PK512607	EF0004 (original), EF0005 (DUP)	Beryllium, Calcium, Zinc	J

Sample Quantitation

Results quantitated between the IDL and the RL ('B' flagged by the laboratory) were qualified as estimated ('J').

4.4 Chlorinated Pesticides by SW-846-8081A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exceptions of the following:

SDG	Samples Affected	Analyte	Validation Qualifier
PK512601	EF1001, EF1002, EF1003	4,4'-DDD, 4,4'-DDT, Chlordane	UJ
PK512601	EF1001, EF1002, EF1003	Toxaphene	**R
PK512602	EF2001, EF2004, EF2005	Chlordane, Endrin, Endrin aldehyde, Endrin ketone, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT	UJ
PK512602	EF2001, EF2004, EF2005	Toxaphene	**R
PK512603	EF0009, EF0010, EF0011	Chlordane	UJ
PK512603	EF0009, EF0010, EF0011	Toxaphene	**R

** 'R' qualifiers assigned due to lack of compound in initial calibration of instrument.

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike / Matrix Spike Duplicate

MS/MSD and LCS was performed for the project samples and all QC criteria were met, with the

following exceptions:

SDG	Samples Affected	Analyte	Validation Qualifier
PK512607	EF0002, EF0004, EF0005	Aldrin, Gamma-BHC, Endrin, Heptachlor	UJ

Field Duplicates

Original and field duplicate results were evaluated and no problems were identified.

Confirmation

Results quantified between the primary and secondary columns met all QC criteria.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.5 Organophosphorus Pesticides by SW-846-8141A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exceptions of the following:

- The following exhibited individual primary CCAL %D>15 and/or confirmation %D>25% : nondetect results were estimated (qualified 'UJ'). Positive results were estimated (qualified 'J') unless 'B' qualified due to blank contamination

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK512606	EF3001, EF3002, EF3003, EF3005	Azinphos-methyl, Bolstar, Chlorpyrifos, Coumaphos, Demeton, Diazinon, Disulfoton, Ethoprop, Fensulfothion, Fethion, Merphos, Methyl parathion, Mevinphos, Naled, Ronnel	UJ
PK512607	EF0002, EF0004, EF0005	Dimethoate, Malathion, Parathion, Phorate, Merphos, Sulfotepp	UJ

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike/Matrix Spike Duplicate

MS/MSD and LCS was performed for the project samples and all QC criteria were met, with the exceptions of the following:

SDG	Samples Affected	Analyte	Validation Qualifier
PK512607	EF0002, EF0004, EF0005	Disulfoton	UJ

Field Duplicates

Original and field duplicate results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.6 Herbicides by SW-846-8151A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exceptions of the following:

SDG	Samples Affected	Analyte	Validation Qualifier
PK512601	EF1001, EF1002, EF1003	MCPA, MCPP	UJ
PK512603	EF0009, EF0010, EF0011	MCPA, MCPP	UJ

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike/Matrix Spike Duplicate

MS/MSD and LCS was performed for the project samples and all QC criteria were met with the following exceptions:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK512606	EF3001, EF3002, EF3003, EF3005	2,4-D	UJ

Field Duplicates

Original and field duplicate results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.7 PCBs by SW-846-8082

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria with the following exceptions:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK512603	EF0009, EF0010, EF0011	All	UJ

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike / Matrix Spike Duplicate

MS/MSD and LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and field duplicate results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.8 Wet Chemistry - Total Organic Carbon by SW-846-9060

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Matrix Spike/Matrix Spike Duplicate

MS/MSD and LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and field duplicate results were evaluated and no problems were noted.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected.

5.0 Quality Assurance Field Split Sample Data Evaluation

Data from the quality assurance split samples supplied to IT by the USACE were reviewed for comparability to the original and field duplicate results. Relative percent differences were calculated and the results are summarized in this section.

- Field split data for PK512606

Original Sample ID EF3002	Field Dup ID EF3003	Field Split ID EF3004	Units	Compounds / Elements	Original / Field Split RPD	% RSD
.059	**.059**	nd	ug/L	Mercury		
1290	1090	212	ug/L	Aluminum	143.5	66.4%
nd	**1.7**	nd	ug/L	Lead		
51	**51.3**	40	ug/L	Barium	24.2%	13.6%
19100	19200	19400	ug/L	Calcium	-1.6%	0.8%
1590	1310	399	ug/L	Iron	119.8	56.6%
8680	8790	9630	ug/L	Magnesium	-10.4%	5.8%
1410	1240	1130	ug/L	Manganese	22.0%	11.2%
756	**831**	1390	ug/L	Potassium	-59.1%	34.9%
1510	**1590**	1180	ug/L	Sodium	24.5%	15.2%
12	nd	nd	ug/L	Zinc		

Metals: Majority of the same metals detected in all samples. Aluminum, iron, and potassium have high RPD values, with iron and potassium detected below the reporting/quantitation limits. Mercury and zinc detected below the reporting limit was reported in the original and not in the FS. Differences attributed to lack of sample homogeneity and/or FS lab not reporting results below the reporting limit.

Semivolatiles, Volatiles, Pesticides, OP Pesticides, PCBs, Herbicides: No compounds detected in any samples.

- Field split data for PK512607

Original Sample ID EF0004	Field Dup ID EF0005	Field Split ID EF0006	Units	Compounds / Elements	Original / Field Split RPD	% RSD
.12	.098	nd	mg/k	Mercury		
4310	5600	9910	mg/k	Aluminum	-78.8%	44.4%
4.0	5.3	6.58	mg/k	Arsenic	-48.8%	24.4%
22.6	35.6	44.4	mg/k	Lead	-65.1%	32.1%
70.8	76.9	101	mg/k	Barium	-35.2%	19.3%
.68	1	nd	mg/k	Selenium		
.42	.72	nd	mg/k	Beryllium		
517	953	1250	mg/k	Calcium	-83.0%	40.7%
7.8	7.8	12.6	mg/k	Chromium	-47.1%	29.5%

Original Sample ID EF0004	Field Dup ID EF0005	Field Split ID EF0006	Units	Compounds / Elements	Original / Field Split RPD	% RSD
4.3	**4.9**	nd	mg/k	Cobalt		
5.5	8.7	9.75	mg/k	Copper	-55.7%	27.7%
10000	12700	14900	mg/k	Iron	-39.4%	19.6%
143	**155**	314	mg/k	Magnesium	-74.8%	46.8%
596	755	831	mg/k	Manganese	-32.9%	16.5%
3.1	**4.2**	5.85	mg/k	Nickel	-61.5%	31.6%
195	**205**	650	mg/k	Potassium	-107.7	74.2%
67.8	**70**	nd	mg/k	Sodium		
16.9	20.4	24.4	mg/k	Vanadium	-36.3%	18.2%
23.4	64.3	66.8	mg/k	Zinc	-96.2%	47.3%
25	27	395	ug/k	Acetone	-176.2	143.0
3.1	3.1	nd	ug/k	Trichlorofluoromethane		
7.0	**6.3**	nd	ug/k	Methylene chloride		

Metals: Majority of the same metals detected in all three samples. Three of the five metals not detected in the FS were below the reporting limits of the original and FD. Al, Pb, Ca, Cu, Mg, Ni, K, and Zn have RPDs above the 50% QC limit for soils. Differences and high RPDs attributed to lack of homogeneity in soils and/or FS lab not reporting results below the reporting limits.

Volatiles: Acetone was detected in all three samples and methylene chloride in the original and FD. Trichlorofluoromethane was detected below the reporting limit in the original and FD. Acetone and methylene chloride are common laboratory contaminants. Differences attributed to lack of homogeneity in soil samples and/or FS lab not reporting results below the reporting limits.

Semivolatiles, Pesticides, OP Pesticides, Herbicides, PCBs: No compounds detected in any of the three samples.

ATTACHMENT A

Validation Qualifiers

U Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit.

J The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

B The concentration reported was detected significantly above the levels reported in the associated equipment rinse samples and/or laboratory method and trip blanks. (5X/10X Rule was applied).

R The reported sample results are rejected due to the following:

1. Severe deficiencies in the supporting quality control data.
2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data.
3. The presence or absence of the constituent cannot be verified based on the data provided.
4. To indicate not to use a particular result in the event of a reanalysis.

UJ The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the 'non-detect' maybe inaccurate or imprecise. The non-detect result should be estimated.

Validation Reason Code Definitions

Reason Code	Description
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding Time Exceeded
02A	Extraction
02B	Analysis
03	Instrument Performance - Outside Criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient <0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits

Validation Reason Code Definitions

Reason Code	Description
10A	Recovery
10B	Retention Time
11	Laboratory control sample recoveries outside specified control limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgement was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings

Data Validation Summary Report for the Site Investigation Performed at the "Fill Area East of Reilly and Former Post Garbage Area (Parcel FA-227) Fort McClellan, Calhoun County, Alabama

1.0 Introduction

Level III data validation was performed on 100 percent of the environmental samples collected at Parcel FA-227. The analytical data consisted of one sample delivery group (SDG), CK922701, which was analyzed by Quanterra Incorporated. The chemical parameters for which the samples were analyzed are identified below:

Parameter (Method)
Volatile Organic Compounds by SW-846-8260B
Semivolatile Organic Compounds by SW-846-8270C
Target Analyte List Metals by SW-846-6010B/7470A/7471A
Organochlorine Pesticides by SW-846-8081A
Organophosphorus Pesticides by SW-8141A
Polychlorinated Biphenyls by SW-846-8082
Chlorinated Herbicides by SW-846-8151A
Nitroaromatics and Nitramines by SW-846-8330

2.0 Procedures

The sample data were validated following the logic identified in the 1994 U.S. Environmental Protection Agency (EPA) *Contract Laboratory Program National Functional Guidelines For Inorganic Data Review* and the 1999 EPA *Contract Laboratory Program National Functional Guidelines For Organic Review* for all areas except blanks. The EPA 1993 *Region III Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses* and 1992 *Region III National Functional Guidelines for Organic Data Review* were applied to the areas associated with blank contamination. Specific quality control (QC) criteria, as identified in the quality assurance plan (QAP), analytical methods, and laboratory standard operating procedures (SOP) were applied to all sample results. As the result of the use of Update III SW-846 test methods for the analytical data and the application of the CLP guidelines during the validation process, there were instances where specific QC requirements for all target compounds were not defined. This primarily occurred in the organic, gas chromatography (GC) and GC/mass spectrometry calibration areas and is due to the fact that the analytical methods are "performance-based," and allows the use of average calibration responses in lieu of individual responses, which are defined by Contract Laboratory Program (CLP) protocol. In light of

applying CLP guidelines to SW-846 methods and evaluating the usability of the data during the validation process, specific QC criteria were determined to address all target compounds and are identified in this report for each parameter, as well as in the validation checklists, which function as worksheets. All completed validation checklists are on file in the Knoxville office. For those analytical methods not addressed by the CLP and Region III guidelines, the validation was based on the method requirements (i. e., SW-846, Code of Federal Regulations, SOP) and technical judgement, following the logic of the CLP validation guidelines.

3.0 Summary of Data Validation Findings

The overall quality of the data was determined to be acceptable. The only rejected data ('R' qualified) was due to "poor performing" volatile compounds (ketones, some halogenated hydrocarbons, e.g.), which exhibited poor calibration responses in the associated calibration data, and samples that were reanalyzed and have more than one result reported. The 'R' qualifier was assigned to the samples with more than one set of results to indicate that a given result should not be used to characterize a particular constituent or an analysis for a given sample.

This validation report has been prepared for all the samples associated with this investigation, and the overall results of the validation findings are summarized in this report. A listing of the validation qualifiers and the reason codes, along with their definitions, is also found in Attachment A. These qualifiers and reason codes were applied to the data and stored in the FTMC database. The following section highlights the key findings of the data validation for each analysis.

4.0 Analysis-Specific Data Validation Summaries

4.1 Volatile Organic Compounds by SW-846-8260B

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exception of the following:

- The following demonstrated relative response factors below 0.1 in the ICAL and/or CCAL: nondetect results were rejected (qualified 'R'). Positive results were estimated (qualified 'J'), unless 'B' qualified due to blank contamination.

SDG Number	Sample Number	Compound	Validation Qualifier
CK922701	DD0012, DD0013, DD0014, DD0015, DD0016	Bromomethane	*R

* 'R' qualifiers take precedence over estimating qualifiers.

- The following exhibited individual ICAL %RSD>30 and/or CCAL %D>20: nondetect results were estimated (qualified 'UJ') unless rejected (qualified 'R') due to ICAL/CCAL minimum RRF criteria not met; Positive results were estimated (qualified 'J') unless 'B' qualified due to blank contamination.

SDG Number	Sample Number	Compound	Validation Qualifier
CK922701	DD0012, DD0013, DD0014, DD0015, DD0016	2-Butanone, 2-Hexanone, Methylene Chloride, Bromomethane, Acetone	**R/UJ/*B

* 'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, takes precedence over estimating qualifiers, assigned due to quantitation.

** 'R' qualifiers take precedence over estimating qualifiers.

Blanks

The 5X/10X rule for contaminants found in the associated equipment rinses, trip, and method blanks was applied to all sample results. All were found to be acceptable, with the exception of the following:

SDG Number	Sample Number	Compound	Blank Contaminant	Validation Qualifier
CK922701	DD0012, DD0013, DD0014, DD0015, DD0016	Methylene Chloride	Method/ER	B

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike/Matrix Spike Duplicate

Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed for the project samples, and all QC criteria were met.

Laboratory Control Sample

Laboratory control sample (LCS) was performed for the project samples, and all QC criteria were met.

Internal Standards

All internal standards met QC criteria.

Field Duplicates

Original and field duplicate (FD) results were evaluated and no problems were identified.

Quantitation

Results quantified between the maximum detection limit (MDL) and the reporting limit (RL), which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.2 Semivolatile Organic Compounds by SW-846-8270C

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exception of the following:

- The following exhibited individual ICAL %RSD>30 and/or CCAL %D>20: nondetect results were estimated (qualified 'UJ'), unless rejected (qualified 'R') due to ICAL/CCAL minimum RRF criteria not met. Positive results were estimated (qualified 'J'), unless 'B' qualified due to blank contamination.

SDG Number	Sample Number	Compound	Validation Qualifier
CK922701	DD0012, DD0013, DD0014, DD0015, DD0016	Hexachlorocyclopentadiene	UJ
SDG Number	Sample Number	Compound	Validation Qualifier
CK922701	DD0014, DD015	2,4-Dinitrophenol	UJ
CK922701	DD0012, DD0013, DD0016	4,6-Dinitro-2-Methylphenol	UJ

Blanks

The 5X/10X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable, with the exception of the following:

SDG Number	Sample Number	Compound	Blank Contaminant	Validation Qualifier
CK922701	DD0012, DD0013, DD0014, DD0015, DD0016	bis(2-Ethylhexyl)phthalate	Method	B

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike/Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Internal Standards

All internal standards met QC criteria.

Field Duplicates

Original and FD results were evaluated and all QC criteria were met.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as "J," were qualified

as estimated J unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected R.

4.3 Metals by SW-846-6010B/7471A/7470A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibrations

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse, calibration, and method blanks was applied to all sample results. All were found to be acceptable with the exception of the following:

SDG Number	Sample Number	Compound	Blank Contaminant	Validation Qualifier
CK922701	DD0012, DD0016	Beryllium	Calibration	B
CK922701	DD0014	Thallium	Calibration	B

Matrix Spike/Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met with the exception of the following:

SDG Number	Sample Number	Compound	Validation Qualifier
CK922701	DD0012, DD0013, DD0014, DD0015, DD0016	Zinc, Antimony	B/J/UJ

* 'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, takes precedence over estimating qualifiers, assigned due to quantitation.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Interference Check Sample

All ICS % recoveries were acceptable. All QC criteria were met.

Inductively Coupled Plasma Serial Dilutions

All QC criteria were met for the serial dilutions associated with the project samples with the exception of the following:

SDG Number	Sample Number	Compound	Validation Qualifier
CK922701	DD0012, DD0013, DD0014, DD0015, DD0016	Cobalt, Magnesium	J

Field Duplicates

Original and FD results were evaluated and all QC criteria were met.

Quantitation

Results quantitated between the instrument detection limit (IDL) and the RL ('B' flagged by the laboratory) were qualified as estimated (J).

4.4 Organochlorine Pesticides by SW-846-8081A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and FD results were evaluated and no problems were identified.

Confirmation

The second column confirmation analysis %D > 25% was exceeded for the following:

SDG Number	Sample Number	Compound	Validation Qualifier
CK922701	DD0014	4,4'-DDE	J

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'. It should be noted that Chlordane (Technical) results for sample DD0014 were estimated (qualified 'J'), due to altered pattern.

4.5 Organophosphorus Pesticides by SW-846-8141A

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike/Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and FD results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.6 Polychlorinated Biphenyls by SW-846-8082

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike/Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and FD results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R.'

4.7 Herbicides by SW-846-8151

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike/Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and FD results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.8 Nitroaromatics and Nitramines by SW-846-8330

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike/Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and FD results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

ATTACHMENT A

Validation Qualifiers

U Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit.

J The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

B The concentration reported was detected significantly above the levels reported in the associated equipment rinse samples and/or laboratory method and trip blanks. (5X/10X Rule was applied).

R The reported sample results are rejected due to the following:

1. Severe deficiencies in the supporting quality control data.
2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data.
3. The presence or absence of the constituent cannot be verified based on the data provided.
4. To indicate not to use a particular result in the event of a reanalysis.

UJ The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the 'non-detect' maybe inaccurate or imprecise. The non-detect result should be estimated.

Validation Reason Code Definitions

Reason Code	Description
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding Time Exceeded
02A	Extraction
02B	Analysis
03	Instrument Performance - Outside Criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient <0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits

Validation Reason Code Definitions

Reason Code	Description
10A	Recovery
10B	Retention Time
11	Laboratory control sample recoveries outside specified control limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgement was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings

Data Validation Summary Report for the Site Investigation Performed at the Fill Area East End Reilly Air Field (Parcel PPMP-227) Fort McClellan, Calhoun County, Alabama

1.0 Introduction

Level III data validation was performed on 100 percent of the environmental samples collected at Parcel PPMP-227. The analytical data consisted of three sample delivery groups (SDG), PK822701 through PK822719, which were analyzed by Quanterra Incorporated. Both soil and water matrices were validated. In addition, an evaluation of the field split (FS) data, which was analyzed by the U.S. Army Corps of Engineers-South Atlantic Division laboratory, is included in this report. The chemical parameters for which the samples were analyzed are identified below:

Parameter (Method)
Target Compound List Volatile Organics by Gas Chromatography/Mass Spectrometry SW-846-8260B
Target Compound List Semivolatiles by Gas Chromatography SW-846-8270C
Metals by SW-846-6010B and 7471A/7470A
Chlorinated Pesticides by SW-846-8081A
Organophosphorous Pesticides by SW-846-8141A
Polychorinated Biphenyls by SW-846-8082
Herbicides by SW-846-8151A
Explosives - Nitroaromatics and Nitramines by High-Performance Liquid Chromatography SW-846 8330
Wet Chemistry -Total Organic Carbon by SW-846 9060

2.0 Procedures

The sample data were validated following the logic identified in the 1994 U.S. Environmental Protection Agency (EPA) *Contract Laboratory Program (CLP) National Functional Guidelines For Inorganic Data Review* and the 1994 EPA *Contract Laboratory Program National Functional Guidelines For Organic Review* for all areas except blanks. The EPA 1993 *Region III Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses* and the 1992 *Region III National Functional Guidelines for Organic Data Review* were applied to

the areas associated with blank contamination. Specific quality control (QC) criteria, as identified in the quality assurance plan (QAP), analytical methods, and laboratory standard operating procedures (SOP) were applied to all sample results. As the result of the use of Update III SW-846 test methods for the analytical data and the application of the Contract Laboratory Program (CLP) guidelines during the validation process, there were instances where specific QC requirements for all target compounds were not defined. This primarily occurred in the organic, gas chromatography (GC) and GC/mass spectrometry calibration areas and is due to the fact that the analytical methods are "performance-based," and allows the use of average calibration responses in lieu of individual responses, which are defined by CLP protocol. In light of applying CLP guidelines to SW-846 methods and evaluating the usability of the data during the validation process, specific QC criteria were determined to address all target compounds and are identified in this report for each parameter, as well as, in the validation checklists, which function as worksheets. All completed validation checklists are on file in the Knoxville office. For those analytical methods not addressed by the CLP and Region III guidelines, the validation was based on the method requirements (i. e. SW-846, Code of Federal Regulations, SOPs, QAP) and technical judgement following the logic of the CLP validation guidelines.

3.0 Summary of Data Validation Findings

The overall quality of the data was determined to be acceptable. The only rejected data ('R' qualified) was due to "poor performing" volatile compounds (ketones, some halogenated hydrocarbons, e.g.), which exhibited poor calibration responses in the associated calibration data, semivolatile acidic fraction for surrogate recovery, and samples that were reanalyzed and have more than one result reported. The 'R' qualifier was assigned to the samples with more than one set of results to indicate that a given result should not be used to characterize a particular constituent or an analysis for a given sample.

This validation report has been prepared for all the samples associated with this investigation and the overall results of the validation findings are summarized in this report. A listing of the validation qualifiers and the reason codes, along with their definitions is also found in Attachment A. These qualifiers and reason codes were applied to the data and stored in the FTMC database. The following section highlights the key findings of the data validations for each analysis.

4.0 Analysis-Specific Data Validation Summaries

4.1 Volatile Organics by GC/Mass Spectrometry SW-846-8260B

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exceptions of the following:

- The following demonstrated relative response factor (RRF) below 0.1 in the ICAL and/or CCAL: nondetect results were rejected (qualified 'R'); positive results were estimated (qualified 'J'); unless 'B' qualified due to blank contamination.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822701	KB2004, KB2005	Acetone, 2-Butanone, 1,2-Dibromo-3-chloropropane	**R
PK822702	KB1002, KB1003	Acetone, 2-Butanone, 1,2-Dibromo-3-chloropropane, Bromochloromethane, Dibromomethane	**R/J
PK822703	KB0001, KB0002, KB0003, KB0004, KB0005, KB0009, KB0010, KB0014	Acetone	*B/**R/J
PK822703	KB0001, KB0002, KB0003, KB0004, KB0005, KB0009, KB0010, KB0014	2-Butanone	**R
PK822703	KB0001, KB0002, KB0003, KB0010	1,2-Dibromo-3-chloropropane, Bromochloromethane, Dibromomethane	**R
PK822703	KB0004, KB0005, KB0009, KB0014	Bromomethane	**R

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822703	KB0001, KB0010	2-Hexanone	**R
PK822704	KB1001, KB1004	Acetone, 2-Butanone, Bromomethane	**R/J
PK822705	KB2001, KB2002, KB2006	Acetone, 2-Butanone, 1,2-Dibromo-3-chloropropane, Bromochloromethane, Dibromomethane	**R/J
PK822706	KB0011, KB0012	Acetone, 2-Butanone, Bromomethane	**R/J
PK822707	KB0007, KB0015	Acetone, 2-Butanone	**R/J
PK822708	KB3001, KB3002, KB3003, KB3004, KB3005, KB3006, KB3015	Acetone, 2-Butanone, 1,2-Dibromo-3-chloropropane	**R
PK822708	KB3015	Bromochloromethane, Dibromomethane	**R
PK822709	KB0019, KB0020, KB0021, KB0023, KB0024	Acetone, 2-Butanone	*B/**R/J
PK822709	KB0020, KB0021, KB0024	Bromochloromethane	**R
PK822710	KB3005 KB3007, KB3009, KB3010, KB3011, KB3014	Acetone, 2-Butanone, 1,2-Dibromo-3-chloropropane, Bromochloromethane, Dibromomethane	*B/**R
PK822711	KB0008, KB0016, KB0017, KB0018	Acetone, 2-Butanone, Bromochloromethane	*B/**R/J
PK822712	KB0006	Acetone, 2-Butanone, Bromochloromethane	**R

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822713	KB3008, KB3012	Acetone, 2-Butanone, 1,2-Dibromo-3-chloropropane	**R

* **'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers, assigned due to quantitation.**

** **'R' qualifiers take precedence over estimating qualifiers.**

- The following exhibited individual ICAL %RSD>30 and/or CCAL %D>20: nondetect results were estimated (qualified 'UJ'); unless rejected (qualified 'R') due to ICAL/CCAL minimum RRF criteria not met; positive results were estimated (qualified 'J'); unless 'B' qualified due to blank contamination.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822701	KB2004, KB2005	Methylene Chloride	*B
PK822702	KB1002, KB1003	2-Hexanone, Naphthalene	UJ
PK822703	KB0001, KB0003, KB0010	4-Methyl-2-pentanone, 1,2-Dibromo-3-chloropropane	*B/**R/UJ
PK822703	KB0001, KB0010	2-Butanone	**R
PK822703	KB0001, KB0002, KB0003, KB0010	2-Hexanone, Naphthalene	**R/UJ
PK822703	KB0001, KB0002, KB0003, KB0004, KB0005, KB0009, KB0010, KB0014	Methylene chloride, Bromomethane	*B/**R/UJ
PK822703	KB0004, KB0005, KB0009, KB0014	Chloroethane, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene	UJ
PK822703	KB0009, KB0014	Dichlorodifluoromethane	UJ
PK822704	KB1001, KB1004	Bromomethane, Chloroethane, Methylene chloride, 1,2,3-Trichlorobenzene	*B/**R/UJ
PK822704	KB1004	Trichlorofluoromethane, 1,2,4-Trichlorobenzene	UJ

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822705	KB2001, KB2002, KB2006	Naphthalene, Methylene chloride, Acetone, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2-Dibromo-3-chloropropane, Hexachlorobutadiene, n-Butylbenzene, p-Isopropyltoluene, sec-Butylbenzene, 2-Hexanone, Dichlorodifluoromethane	**R/UJ/J
PK822705	KB2002, KB2006	2-Butanone, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 4-Methyl-2-pentanone	**R/UJ
PK822706	KB0011, KB0012	Chloroethane, Methylene chloride, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, Bromomethane	*B/**R/UJ
PK822706	KB0012	Acetone, Trichlorofluoromethane	J
PK822707	KB0007, KB0015	Dichlorodifluoromethane, Acetone, Methylene chloride	*B/UJ/J
PK822708	KB3001, KB3002, KB3003, KB3004, KB3006, KB3015	Methylene chloride	UJ
PK822708	KB3001, KB3002, KB3003, KB3004, KB3006	1,2-Dibromo-3-chloropropane	**R
PK822708	KB3015	1,2,3-Trichlorobenzene	UJ
PK822709	KB0019, KB0023	Acetone, Dichlorodifluoromethane	*B/**R/UJ
PK822709	KB0019, KB0020, KB0021, KB0023, KB0024	Methylene chloride	*B
PK822709	KB0024	Bromomethane	UJ

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822710	KB3005, KB3007, KB3009, KB3010, KB3011, KB3014	Chloromethane, 1,2,3-Trichlorobenzene, Methylene chloride, Naphthalene, Dichlorodifluoromethane	UJ
PK822711	KB0008	Chloromethane, Dichlorodifluoromethane	UJ
PK822711	KB0008, KB0016, KB0017, KB0018	Methylene chloride	*B
PK822712	KB0006	Methylene chloride	*B
PK822713	KB3008, KB3012	1,2-Dibromo-3-chloropropane	**R
PK822713	KB3012	Bromomethane, Naphthalene, 1,1,2,2-Tetrachloroethane, 2-Hexanone, 4-Methyl-2-pentanone	UJ

* **'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers, assigned due to quantitation.**

** **'R' qualifiers take precedence over estimating qualifiers.**

Blanks

The 5X/10X rule for contaminants found in the associated equipment rinses, trip blanks, and method blanks was applied to all sample results. All were found to be acceptable with the exception of the following:

Note: 'B' qualifiers were applied to all of the following sample results.

SDG	Samples Affected	Analyte/Analytes	Associated Blank Contamination
PK822701	KB2004, KB2005	Methylene Chloride	Method/TB
PK822702	KB1002, KB1003	Methylene Chloride	Method/ER
PK822703	KB0001, KB0002, KB0003, KB0004, KB0005, KB0009, KB0010, KB0014	Methylene Chloride	Method
PK822703	KB0003, KB0005, KB0010	Acetone	ER

SDG	Samples Affected	Analyte/Analytes	Associated Blank Contamination
PK822704	KB1001, KB1004	Methylene Chloride	Method
PK822706	KB0011, KB0012	Methylene Chloride	Method
PK822707	KB0007, KB0015	Methylene Chloride	Method
PK822709	KB0019, KB0020, KB0021, KB0023, KB0024	Methylene Chloride	Method
PK822709	KB0020, KB0021	Acetone	Method
PK822710	KB3007, KB3009, KB3010, KB3011	Acetone	ER
PK822711	KB0008, KB0016, KB0017, KB0018	Acetone, Methylene Chloride	Method/ER/TB
PK822712	KB0006	Methylene Chloride	Method
PK822713	KB3012	Methylene Chloride	Method/TB

'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers, assigned due to quantitation.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC limits, with the following exceptions:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822702	KB1002, KB1003	Acetone, 2-Butanone, Methylene Chloride	*B/J
PK822702	KB1003	Toluene	J

* **'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers, assigned due to quantitation.**

Matrix Spike/Matrix Spike Duplicate

Matrix spike/matrix spike duplicate (MS/MSD) and laboratory control sample (LCS) were performed for the project samples and all QC criteria were met.

Field Duplicates

Original and field duplicate (FD) results were evaluated and no problems were noted, with the exception of the following:

Note: Soil-50 percent criteria applied. Water-35 percent criteria applied.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822706	KB0011 (original), KB0012 (duplicate)	Acetone	J

Internal Standards

All internal standards met criteria with the exception of the following:

- All compounds associated with the internal standards listed in the table below were qualified as indicated.

SDG	Samples Affected	Internal Standard Outside QC Limits	Validation Qualifier
PK822702	KB1002, KB1003	1,4-Dichlorobenzene-d4	**R/UJ
PK822703	KB0004, KB0005	1,4-Dichlorobenzene-d4	UJ
PK822704	KB1001, KB1004	1,4-Dichlorobenzene-d4	UJ
PK822706	KB0012	1,4-Dichlorobenzene-d4	UJ
PK822709	KB0019, KB0020, KB0021, KB0024	1,4-Dichlorobenzene-d4	UJ/J
PK822711	KB0008, KB0016, KB0017, KB0018	1,4-Dichlorobenzene-d4	UJ/J
PK822711	KB0008	Chlorobenzene-d5	UJ/J
PK822712	KB0006	1,4-Dichlorobenzene-d4	UJ

** **'R' qualifiers take precedence over estimating qualifiers.**

Quantitation

Results quantified between the method detection limit (MDL) and the reporting limit (RL), which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.2 Target Compound List Semivolatiles by GC/Mass Spectrometry SW-846-8270C

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria with the exceptions of the following:

The following exhibited individual ICAL %RSD>30 and/or CCAL %D>20:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822701	KB2004, KB2005	Hexachlorocyclopentadiene, 4-Nitrophenol	UJ
PK822702	KB1002, KB1003	2-Nitroaniline, 3-Nitroaniline, 4-Nitroaniline, 4-Nitrophenol, Hexachlorocyclopentadiene, 2-Methylphenol, 4-Chloroaniline	UJ
PK822703	KB0001, KB0002, KB0003, KB0004, KB0005, KB0009, KB0010, KB0014	3-Nitroaniline, 4-Nitrophenol	UJ
PK822703	KB0001, KB0002, KB0003, KB0004, KB0005, KB0009, KB0010	Hexachlorocyclopentadiene	UJ

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822703	KB0002, KB0003, KB0004, KB0005, KB0009, KB0010	Carbazole, 2-Nitroaniline, 3,3'-Dichlorobenzidine	UJ
PK822703	KB0014	n-Nitro-di-n-propylamine, 4-Chloroaniline, 2-Nitroaniline, Benzo(k)fluoranthene	UJ
PK822705	KB2001, KB2002, KB2006	Hexachlorocyclopentadiene	UJ
PK822707	KB0007, KB0015	Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene	UJ
PK822708	KB3001, KB3002, KB3003, KB3004, KB3015	3,3'-Dichlorobenzidine	UJ
PK822708	KB3001, KB3015	Carbazole	UJ
PK822708	KB3002, KB3003, KB3004	Benzo(ghi)perylene, Indeno(1,2,3-cd)pyrene	UJ
PK822709	KB0024	3,3'-Dichlorobenzidine	UJ
PK822710	KB3007, KB3011, KB3014	3,3'-Dichlorobenzidine, Hexachlorocyclopentadiene	UJ
PK822710	KB3005, KB3009, KB3010	Benzo(ghi)perylene	UJ
PK822711	KB0008	4-Nitroaniline, Bis(2-ethylhexyl)phthalate	UJ
PK822712	KB0006	4-Nitroaniline, Bis(2-ethylhexyl)phthalate	UJ
PK822713	KB3008, KB3012	3,3'-Dichlorobenzene, Pyrene	UJ

Blanks

The 5X/10X rule for contaminants found in the associated equipment rinses, trip blanks, and method blanks was applied to all sample results. All were found to be acceptable with the exception of the following:

Note: 'B' qualifiers were applied to all of the following sample results.

SDG	Samples Affected	Analyte/Analytes	Associated Blank Contamination
PK822702	KB1003	Bis(2-ethylhexyl)phthalate	Method
PK822703	KB0001, KB0003, KB0004, KB0005, KB0009, KB0010, KB0014	Bis(2-ethylhexyl)phthalate	Method
PK822703	KB0001, KB0003, KB0004, KB0005, KB0010	Di-n-butylphthalate	Method
PK822704	KB1001	Bis(2-ethylhexyl)phthalate	Method
PK822709	KB0020, KB0021, KB0023	Bis(2-ethylhexyl)phthalate	Method/ER

'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers, assigned due to quantitation.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC limits, with the exception of the following. The acid fraction compounds were rejected due to poor recoveries.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822708	KB3004	2,4-Dinitrophenol, 4,6-Dinitro-2-Methylphenol, 4-Nitrophenol, Pentachlorophenol, Phenol, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2-Methylphenol, 2-Nitrophenol, 4-Methylphenol, 4-Chloro-3-Methylphenol, 2-Chlorophenol	**R

** **'R' qualifiers take precedence over estimating qualifiers.**

Matrix Spike/Matrix Spike Duplicate

MS/MSD were evaluated and all QC criteria were met, with exception of the following. Qualification was necessary due to high RPDs and low recoveries.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822708	KB3001, KB3002, KB3003, KB3004, KB3006, KB3015	All reported compounds	**R/UJ

** **'R' qualifiers take precedence over estimating qualifiers.**

Laboratory Control Sample/Laboratory Control Sample Duplicate

Laboratory control sample (LCS) was evaluated and all QC criteria were met, with the exception of the following. Qualification was necessary due to high RPDs in the batch LCS.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822710	KB0005, KB0009, KB0010	Pentachlorophenol, Acenaphthene, 4-Chloro-3-Methylphenol	UJ

Field Duplicates

Original and FD results were evaluated; no problems were noted, with the exception of the following:

Note: Soil-50 percent criteria applied. Water-35 percent criteria applied.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822709	KB0020 (original), KB0021 (duplicate)	Bis(2-ethylhexyl)phthalate	*B

* **'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers, assigned due to quantitation.**

Internal Standards

All internal standards met criteria with the exception of the following:

- All compounds associated with the internal standards listed in the table below were qualified as indicated. The internal standards recovery for Perylene-d12 was high for SDG PK822708 sample KB3003, no results were detected, no qualifiers were necessary.

SDG	Samples Affected	Internal Standard Outside QC Limits	Validation Qualifier
PK822708	KB3001, KB3015	Perylene-d12	UJ
PK822709	KB0023	Phenanthrene-d10	UJ
PK822709	KB0020, KB0021, KB0023, KB0024	Perylene-d12	UJ

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.3 Metals by SW-846-6010B/7471A/7470A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing calibrations

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse, calibration, and method blanks was applied to all sample results. All were acceptable with the exceptions noted below:

Note: 'B' qualifiers were applied to all of the following sample results.

SDG	Samples Affected	Element/Elements	Associated Blank Contamination
PK822701	KB2004, KB2005	Aluminum, Sodium	Method/Calibration

SDG	Samples Affected	Element/Elements	Associated Blank Contamination
PK822702	KB1002, KB1003	Sodium	Method/ER
PK822703	KB0001, KB0002, KB0003, KB0004, KB0005, KB0009, KB0010, KB0014	Sodium	Method/Calibration/ER
PK822703	KB0001, KB0004, KB0009	Calcium	ER
PK822703	KB0004, KB0005, KB0009	Nickel	Calibration
PK822704	KB1001, KB1004	Sodium	Method/Calibration/ER
PK822705	KB2001, KB2002, KB2006	Sodium	Method/Calibration
PK822705	KB2006	Iron, Potassium, Aluminum	Calibration
PK822706	KB0011, KB0012	Sodium	Method/Calibration/ER
PK822706	KB0012	Calcium	ER
PK822707	KB0007, KB0015	Sodium, Magnesium, Calcium	Method/Calibration/ER
PK822708	KB3001, KB3003, KB3004, KB3006, KB3015	Sodium	Method/Calibration/ER
PK822708	KB3001	Aluminum, Iron	Method/Calibration/ER
PK822708	KB3001, KB3015	Thallium	Calibration/ER
PK822708	KB3002, KB3003	Mercury	ER
PK822708	KB3002	Copper	Method/Calibration
PK822709	KB0019, KB0020, KB0021, KB0023, KB0024	Sodium	Method/Calibration/ER
PK822709	KB0020, KB0021, KB0023	Mercury	ER
PK822710	KB3005, KB3007, KB3009, KB3010, KB3011	Sodium	Method/Calibration

SDG	Samples Affected	Element/Elements	Associated Blank Contamination
PK822710	KB3007, KB3010, KB3011, 3014	Thallium	Calibration/ER
PK822710	KB3009	Chromium	Calibration
PK822710	KB3010, KB3011	Aluminum, Iron	Method/Calibration
PK822711	KB0008, KB0017, KB0018	Mercury	Method
PK822711	KB0008, KB0016, KB0017, KB0018	Sodium	Method/Calibration/ER
PK822712	KB0006	Sodium	Method/Calibration/ER
PK822713	KB3008, KB3012	Potassium	Calibration
PK822713	KB3008	Beryllium	Method

'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers, assigned due to quantitation.

Matrix Spike/Matrix Spike Duplicate

Batch QC was performed for the project samples and all QC criteria were met, with the exception of the following:

SDG	Samples Affected	Element/Elements	Validation Qualifier
PK822703	KB0001, KB0002, KB0003, KB0004, KB0009, KB0010, KB0014	Silver, Cobalt, Copper, Chromium, Lead, Vanadium, Antimony	UJ/J
PK822707	KB0007, KB0015	Antimony, Chromium, Vanadium, Zinc, Manganese	UJ/J
PK822708	KB3001, KB3002, KB3003, KB3004, KB3006, KB3015	Aluminum	*B/J
PK822711	KB0008, KB0016, KB0017, KB0018	Antimony	UJ

* **'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers assigned due to quantitation.**

Laboratory Control Sample

All QC criteria were met for the LCS associated with the project sample analyses.

Interference Check Sample

All interference check sample (ICS) percent recoveries, where applicable, were acceptable with the exception of the following:

SDG	Samples Affected	Element/Elements	Validation Qualifier
PK822708	KB3001, KB3002, KB3003, KB3004, KB3006, KB3015	Iron	J
PK822708	KB3001, KB3002, KB3003, KB3004, KB3015	Potassium	J

Inductively-Coupled Plasma Serial Dilutions

All QC criteria were met with the following exceptions:

SDG	Samples Affected	Element/Elements	Validation Qualifier
PK822703	KB0001, KB0002, KB0003, KB0004, KB0005, KB0009, KB0010, KB0014	Manganese, Magnesium, Zinc, Lead	J
PK822707	KB0007, KB0015	Magnesium, Zinc, Barium, Potassium, Aluminum	J
PK822710	KB3005, KB3007, KB3014	Vanadium	J
PK822710	KB3005, KB3007, KB3009, KB3010, KB3014	Sodium	J
PK822711	KB0008, KB0016, KB0017, KB0018	Magnesium, Zinc, Calcium, Aluminum	J
PK822713	KB3008, KB3012	Sodium	J

Field Duplicates

Original and FD results were evaluated and no problems were noted, with the exception of the following:

Note: Soil-50 percent criteria applied. Water-35 percent criteria applied.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822705	KB2001 (original), KB2002 (duplicate)	Manganese, Iron	J
PK822709	KB0020 (original), KB0021 (duplicate)	Manganese	J

Sample Quantitation

Results quantified between the instrument detection limit (IDL) and the RL ('B' flagged by the laboratory) were qualified as estimated (J).

4.4 Chlorinated Pesticides by SW-846-8081A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exception of the following:

- Samples were qualified for the compounds listed below, due to a correlation coefficient less than 0.990. nondetect results were estimated (qualified 'UJ'); positive results were estimated (qualified 'J'); unless 'B' qualified due to blank contamination.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822707	KB0007, KB0015	Alpha-BHC, Gamma-BHC (Lindane), Endosulfan II	UJ

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC limits.

Matrix Spike/Matrix Spike Duplicate

MS/MSD were evaluated and no problems were noted and all QC criteria were met.

Laboratory Control Sample/Laboratory Control Sample Duplicate

LCS was evaluated, all QC criteria were met, with the exception of the following. Qualification was necessary due to low percent recoveries in the batch LCS.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822704	KB1004	Aldrin	UJ
PK822706	KB0011, KB0012	Aldrin	UJ

Field Duplicates

Original and FD results were evaluated and no problems were noted.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected.

4.5 Organophosphorous Pesticides by SW-846-8141A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples except sample KB1003 from SDG PK822702, which was estimated (qualified 'UJ') due to analysis outside of hold time.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria, with the exceptions of the following:

- The following exhibited individual ICAL %RSD>20: nondetect results were estimated (qualified 'UJ'); positive results were estimated (qualified 'J'); unless 'B' qualified due to blank contamination.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822708	KB3001, KB3002, KB3003, KB3004, KB3006	Azinphos-Methyl, Malathion, Stirophos, Fensulfothion, Famphur, Merphos, Mevinphos, Tokuthion	UJ
PK822709	KB0019, KB0020, KB0021, KB0023, KB0024	Merphos, Naled	UJ
PK822710	KB3005, KB3007, KB3009, KB3010, KB3011, KB3014	Azinphos-Methyl, Demeton (Total), Merphos, Fensulfothion	UJ
PK822711	KB0008, KB0016, KB0017, KB0018	Merphos, Naled	UJ
PK822712	KB0006	Merphos, Naled	UJ
PK822713	KB3008, KB3012	Merphos	UJ
PK822713	KB3008	Azinphos-Methyl, Fensulfothion	UJ
PK822713	KB3012	Naled	UJ
PK822714	KB1001R	Merphos, Naled	UJ
PK822715	KB0002R, KB0004R, KB0005R	Merphos, Naled	UJ

- The following exhibited individual primary CCAL %D>15 and/or confirmation %D>25 percent: nondetect results were estimated (qualified 'UJ'); positive results were estimated (qualified 'J'); unless 'B' qualified due to blank contamination.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822702	KB1003	Naled	UJ
PK822703	KB0001	Dimethoate	UJ
PK822705	KB2006	Demeton (Total), Diazinon, Disulfoton, Phorate, Ethoprop, Dichlorvos	UJ
PK822707	KB0015	Mevinphos	UJ
PK822708	KB3001, KB3002, KB3003, KB3004, KB3006, KB3015	Azinphos-Methyl, Malathion, Stirophos, Naled	UJ
PK822708	KB3001, KB3002, KB3003, KB3004, KB3006	Dimethoate, Sulfotepp, Thionazin	UJ
PK822708	KB3015	Bolstar, Chlorpyrifos, Coumaphos, Diazinon, Dichlorvos, Ethoprop, Fensulfothion, Fenthion, Merphos, Mevinphos, Phorate, Ronnel, Tokuthion, Trichloronate, Demeton (Total)	UJ
PK822709	KB0019, KB0020, KB0021, KB0023, KB0024	Coumaphos, Demeton (Total), Fensulfothion, Mevinphos	UJ
PK822709	KB0024	Merphos, Dimethoate, Sulfotepp	UJ
PK822710	KB3005, KB3007, KB3009, KB3010, KB3011, KB3014	Demeton (Total), Fensulfothion, Naled	UJ
PK822710	KB3005, KB3009, KB3010	Dimethoate, Parathion, Malathion, Famphur, Sulfotepp, Thionazin	UJ
PK822710	KB3007, KB3009, KB3010, KB3011, KB3014	Azinphos-Methyl, Bolstar, Chlorpyrifos, Coumaphos, Diazinon, Disulfoton, Ethoprop, Fenthion, Methyl Parathion, Mevinphos, Ronnel	UJ
PK822710	KB3009, KB3010, KB3014	Merphos	UJ
PK822711	KB0008, KB0017, KB0018	Merphos, Dimethoate, Sulfotepp	UJ

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822711	KB0016	Ethoprop, Demeton (Total), Fensulfothion, Mevinphos	UJ
PK822712	KB0006	Merphos, Dimethoate, Sulfotepp, Malathion	UJ
PK822713	KB3008	Merphos, Dimethoate, Famphur, Demeton (Total), Malathion, Sulfotepp, Naled, Thionazin	
PK822713	KB3012	Azinphos-Methyl, Bolstar, Coumaphos, Demeton (Total), Diazinon, Disulfoton, Ethoprop, Fenthion, Methyl Parathion, Mevinphos, Ronnel, Phorate, Fensulfothion, Dichlorvos, Merphos	UJ
PK822714	KB1001R, KB1004R	Merphos, Malathion	UJ
PK822714	KB1001R	Bolstar, Coumaphos, Naled, Diazinon, Famphur, Sulfotepp, Thionazin	UJ
PK822715	KB0002R, KB0004R, KB0005R	Merphos, Bolstar, Coumaphos, Naled, Sulfotepp, Disulfoton, Phorate, Stirophos, Thionazin, Tokuthion, Diazinon	UJ

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied with the exception of the following:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822702	KB1003	All reported compounds	UJ

Matrix Spike/Matrix Spike Duplicate

MS/MSD were evaluated and no problems were noted and all QC criteria were met with the exception of the following:

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822708	KB3001, KB3002, KB3003, KB3004, KB3006, KB3015	Dimethoate	UJ
PK822711	KB0016, KB0017, KB0018	Disulfoton	UJ

Laboratory Control Sample/Laboratory Control Sample Duplicate

LCS was evaluated and all QC criteria were met, with the exception of the following. Qualification was necessary due to low percent recoveries in the batch LCS.

SDG	Samples Affected	Analyte/Analytes	Validation Qualifier
PK822714	KB1004R	Thionazin	UJ

Field Duplicates

Original and field duplicate results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J,' were qualified as estimated 'J' unless blank contamination was present or the results were rejected.

4.6 Polychlorinated Biphenyls by SW-846-8082

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration